Illinois Department of Transportation

To:	Masood Ahmad	Attn: Rebecca Marruffo	
From:	Jack Elston	By: Michael Brand	
Subject:	Pavement Design Approval		
Date:	December 23, 2019		

Route:	FAP 301 (US 20)	Job No.:	D-92-103-05
Section:	24R	Contract No.:	64B40
County:	Jo Daviess	Target Letting:	
Limits:	Logemann Road to 0.2 miles West of S. Park Road		

We have reviewed the pavement design for the above referenced project which was most recently submitted on November26, 2019. The scope of the project involves reconstructing US 20 to improve the horizontal and vertical alignment.

The pavement design resulted in two pavement options: 9.5" Full-Depth HMA and 9" PCC. The life-cycle cost analysis of those options resulted in the HMA pavement being 11.4% less expensive ($75,761/mile compared to PCC's cost of $84,283/mile).

In summary, the approved pavement design is as follows:

9.5" Full-Depth HMA
w/ HMA Shoulders (some Curb & Gutter)
12" Improved Subgrade

If you have any questions, please contact Mike Brand at (217) 782-7651.

Illinois Department of Transportation

Memorandum

To:	Jack Elston	Attn: Michael Brand
From:	Masood Ahmad.	By: Rebecca Marruffo
Subject:	Pavement Design Renewal	
Date:	November 26, 2019	

FAP Route 301 (US 20)
Section 24R
Jo Daviess County
Job No. D-92-103-05
Contract No. 64B40

From Logemann Road to approximately 0.5 miles West of Canyon Park Road will be reconstructed with a horizontal realignment to the north approximately 65 feet and vertical realignments.

From 0.5 miles West of Canyon Park Road to approximately 0.16 miles West of Golf/Mapes Road will be reconstructed with the addition of 8 foot shoulders and grading and shaping of the ditches.

From approximately 0.16 miles West of Golf/Mapes Road to 0.2 miles West of S. Park Road/Rush Street will be reconstructed with a horizontal and vertical realignment with a frontage road for the entrances at the crest.

Attached is the pavement selection analysis for the subject section. This section consists of approximately 57,300 square yards of rural roadway.

A comparison was performed between the following Mechanistic Pavement Designs:

1. Flexible pavement design
2. Rigid pavement design that included 4" stabilized sub-base with PCC Shoulders

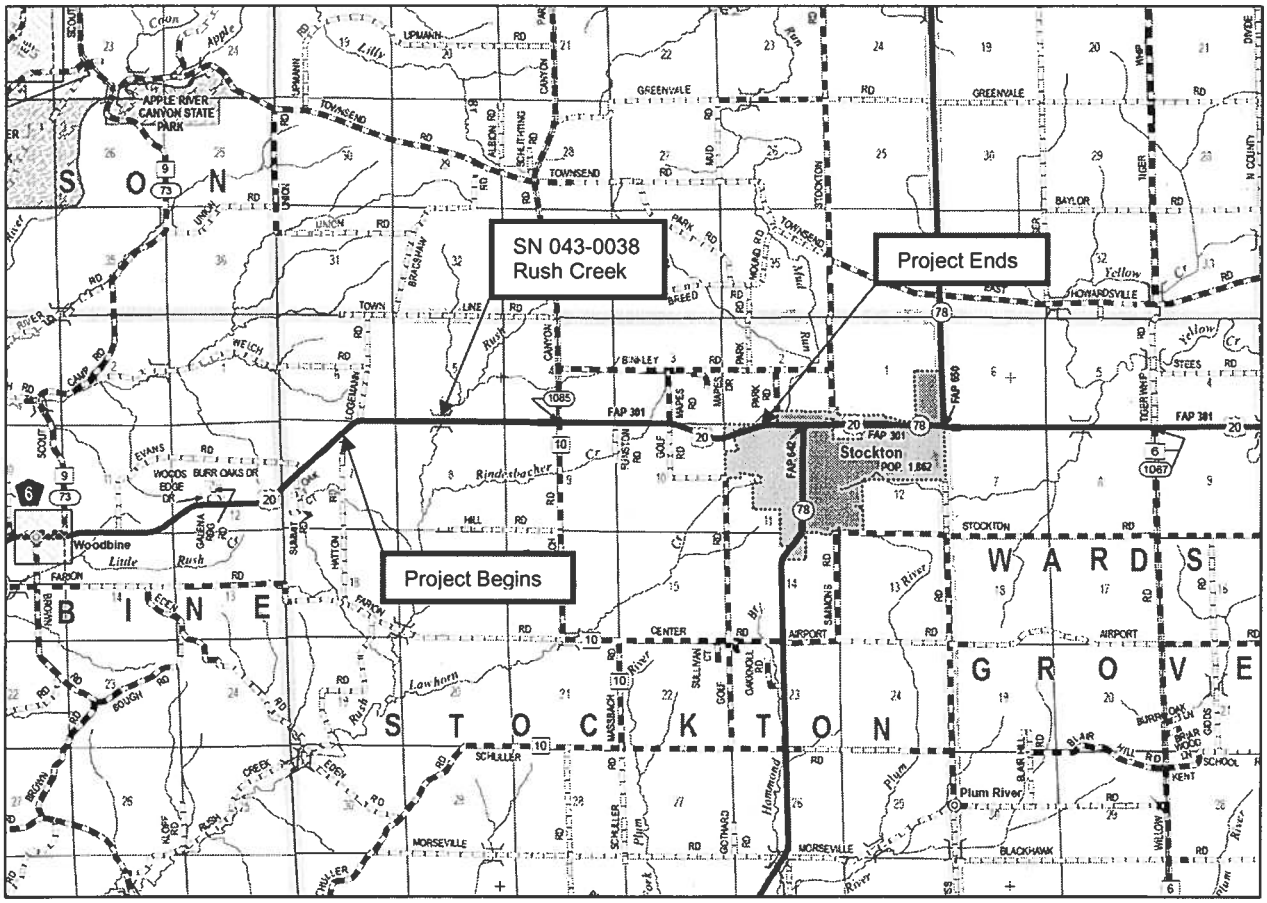
Option 1 indicates that the flexible pavement presents the lowest life cycle costs, providing an 11.4% annual cost savings versus Option 2, a rigid pavement design.

The District would like to recommend renewal of the flexible pavement design consisting of 9.5" of Hot-Mix Asphalt Pavement for US 20. The District's recommendation is based on a rural area, lowest life cycle cost, and constructability.

If you have any questions or need additional information, please contact Traci Duden at 815/284-5932.

td-0317:kjo
Attachments

Location Map



FAP 301 (US 20)

Sec 24R

JoDaviess County

P-92-103-05

Contract No 64B40

Stockton Township, Range T. 27 N.-R.4 E., Sections 2, 3, 4, 5, 6, 7, 8, 9, 10, 11

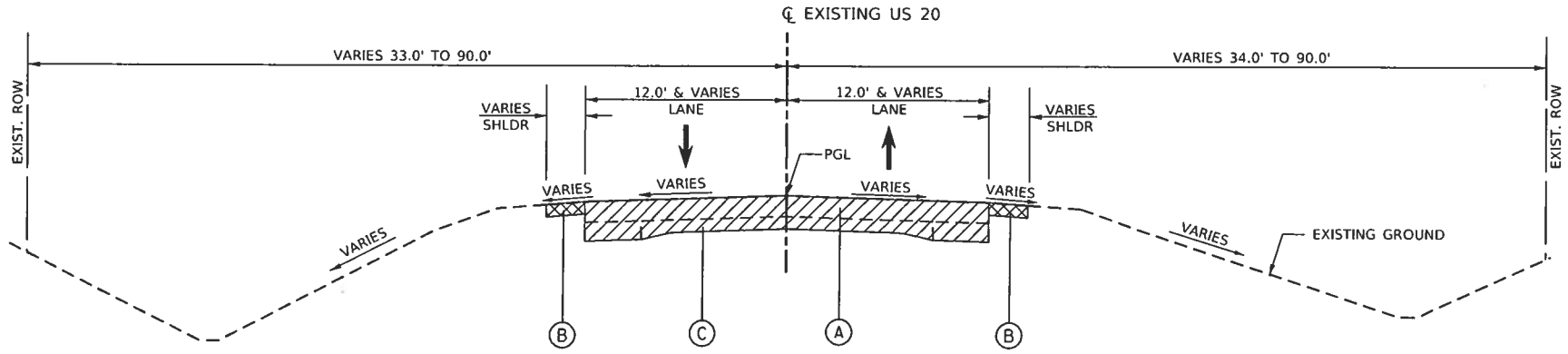
4.07 miles, 0.2mi West of Logemann Road to Rush St. in Stockton

FY 2024

Horizontal and Vertical Realignment from Logemann Road to Canyon Park Road, Vertical Realignment from Canyon Park Road to Mapes/Golf Road, and Horizontal and Vertical Realignment from Mapes/Golf Road to Park Road.

NHPP Funds

Contact: Traci Duden 815-284-5932

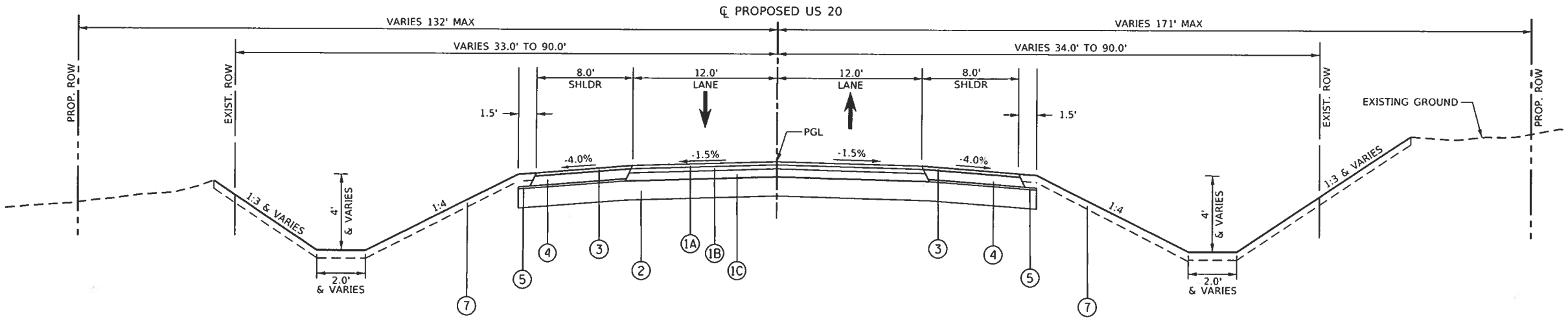


EXISTING TYPICAL SECTION – US ROUTE 20

STA. 1968+90.00 TO STA. 2183+58.00

EXISTING LEGEND

- (A) 10" EXISTING ASPHALT PAVEMENT
- (B) 8" EXISTING ASPHALT SHOULDER
- (C) 9"-6"-9" EXISTING PCC PAVEMENT
- PAVEMENT REMOVAL
- PAVED SHOULDER REMOVAL



PROPOSED TYPICAL SECTION – US ROUTE 20

STA. 1968+90.00 TO STA. 1972+00.00

AGGREGATE SUBGRADE IMPROVEMENT THICKNESS AND LOCATIONS

LOCATION	STATION	TO	STATION	THICKNESS
US 20	1970+00		1970+50	30"
US 20	1970+50		1971+50	36"
US 20	1971+50		1979+50	18"
US 20	1990+50		1993+50	6"
US 20	1994+50		1995+50	18"
US 20	1995+50		1999+50	6"
US 20	2008+50		2015+50	6"
US 20	2015+50		2016+50	18"
US 20	2026+50		2033+00	6"
US 20	2036+50		2037+50	18"
US 20	2037+50		2039+50	24"
US 20	2039+50		2040+50	30"
US 20	2040+50		2042+50	18"
US 20	2043+50		2046+50	18"
US 20	2046+50		2048+50	24"
US 20	2048+50		2049+50	30"
US 20	2135+00		2136+00	18"
US 20	2142+00		2145+00	18"
US 20	2148+00		2150+00	18"
US 20	2150+00		2156+00	6"
US 20	2156+00		2157+00	18"
US 20	2174+00		2183+58.00	18"

AGGREGATE SUBGRADE IMPROVEMENT THICKNESSES AND LOCATIONS CONTINUED

LOCATION	STATION	TO	STATION	THICKNESS
CONNECTOR RD	596+62		597+50	18"
FRONTAGE RD	17+00		21+00	6"
FRONTAGE RD	21+00		25+00	18"
FRONTAGE RD	25+00		29+00	24"
FRONTAGE RD	29+00		30+00	18"

PROPOSED LEGEND

1. HOT-MIX ASPHALT PAVEMENT (FULL-DEPTH), 9 1/2"
   - (1A) 2" POLYMERIZED HOT-MIX ASPHALT SURFACE COURSE, MIX "D", N70
   - (1B) 2 1/2" POLYMERIZED HOT-MIX ASPHALT BINDER COURSE, IL-19.0, N70
   - (1C) 5" LEVELING BINDER (MACHINE METHOD), N70
2. AGGREGATE SUBGRADE IMPROVEMENT, 12" (REFER TO TABLE PROVIDED FOR VARYING THICKNESSES AND LOCATIONS)
3. 2" POLYMERIZED HOT-MIX ASPHALT SURFACE COURSE, MIX "D", N70
4. HOT-MIX ASPHALT SHOULDER, 6"
5. CA6 OR CA10 (COST INCLUDED IN HOT-MIX ASPHALT SHOULDERS, 6")
6. 3" INCIDENTAL HOT-MIX ASPHALT SURFACING
7. TOPSOIL FURNISH AND PLACE, 6"
8. COMBINATION CONCRETE CURB & GUTTER, TYPE B-6.24
9. AGGREGATE SHOULDERS, TYPE B 6"
10. STEEL PLATE BEAM GUARDRAIL, TYPE A, 9 FOOT POSTS

NOTE: THE UNIT WEIGHT USED TO CALCULATE ALL HOT-MIX ASPHALT SURFACE MIXTURES IS 112 LBS/SQ.YD./IN

MODEL: Default
FILE NAME: pw:\\r2hdw01-naamh.com:PW_RSHDocuments\Transportation\Projects\11300559.000 US 20 Stockton\CAD\CAD Sheets\D26400-sht-typ01.dgn

RS&H

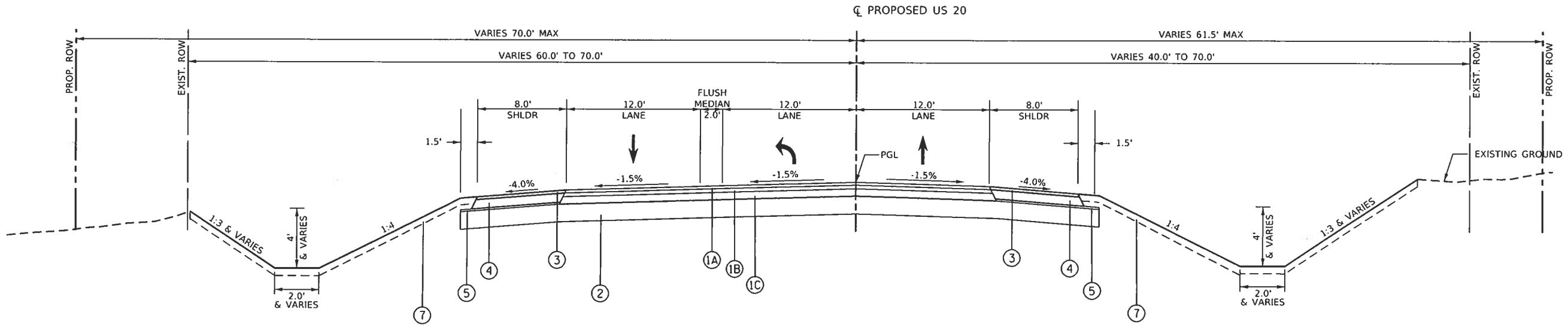
USER NAME = EtzwilleE	DESIGNED - ALM	REVISED -	
	DRAWN - ALM	REVISED -	
PLOT SCALE = 100.0000 ' / in.	CHECKED - CPK	REVISED -	
PLOT DATE = 2/18/2019	DATE - 2/18/2019	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

TYPICAL SECTIONS
US 20

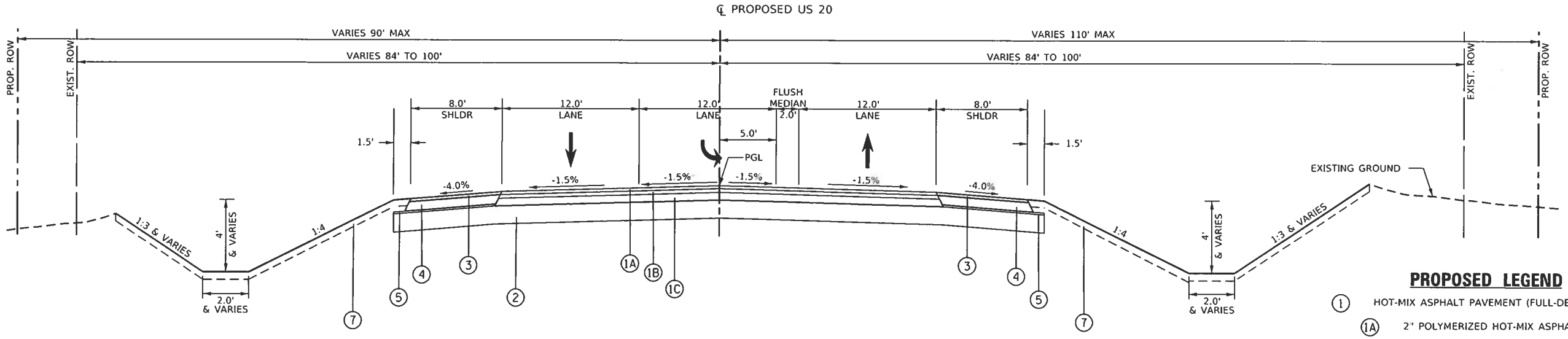
SCALE: N.T.S. | SHEET 1 OF 14 SHEETS | STA. | TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
301	24R	JODAVIESS	493	20
		CONTRACT NO. 64B40		
	ILLINOIS	FED. AID PROJECT		



PROPOSED TYPICAL SECTION – US ROUTE 20 AT LOGEMANN RD

STA. 1978+00.00 TO STA. 1979+94.18



PROPOSED TYPICAL SECTION – US ROUTE 20 AT CONNECTOR RD

STA. 2164+19.96 TO STA. 2165+89.62

PROPOSED LEGEND

1. HOT-MIX ASPHALT PAVEMENT (FULL-DEPTH), 9 1/2"
   - 1A 2" POLYMERIZED HOT-MIX ASPHALT SURFACE COURSE, MIX "D", N70
   - 1B 2 1/2" POLYMERIZED HOT-MIX ASPHALT BINDER COURSE, IL-19.0, N70
   - 1C 5" LEVELING BINDER (MACHINE METHOD), N70
2. AGGREGATE SUBGRADE IMPROVEMENT, 12" (REFER TO TABLE PROVIDED FOR VARYING THICKNESSES AND LOCATIONS)
3. 2" POLYMERIZED HOT-MIX ASPHALT SURFACE COURSE, MIX "D", N70
4. HOT-MIX ASPHALT SHOULDER, 6"
5. CA6 OR CA10 (COST INCLUDED IN HOT-MIX ASPHALT SHOULDERS, 6")
6. 3" INCIDENTAL HOT-MIX ASPHALT SURFACING
7. TOPSOIL FURNISH AND PLACE, 6"
8. COMBINATION CONCRETE CURB & GUTTER, TYPE B-6.24
9. AGGREGATE SHOULDERS, TYPE B 6"
10. STEEL PLATE BEAM GUARDRAIL, TYPE A, 9 FOOT POSTS

NOTE: THE UNIT WEIGHT USED TO CALCULATE ALL HOT-MIX ASPHALT SURFACE MIXTURES IS 112 LBS/SQ.YD./IN

MODEL: Default
FILE NAME: pw:\\rshow01.rsandh.com:PW_RSHDocuments\Transportation\Projects\130059.000 US 20 Stockton\CADCAD Sheets\D2648B40-sht-typ02.dgn

RS&H

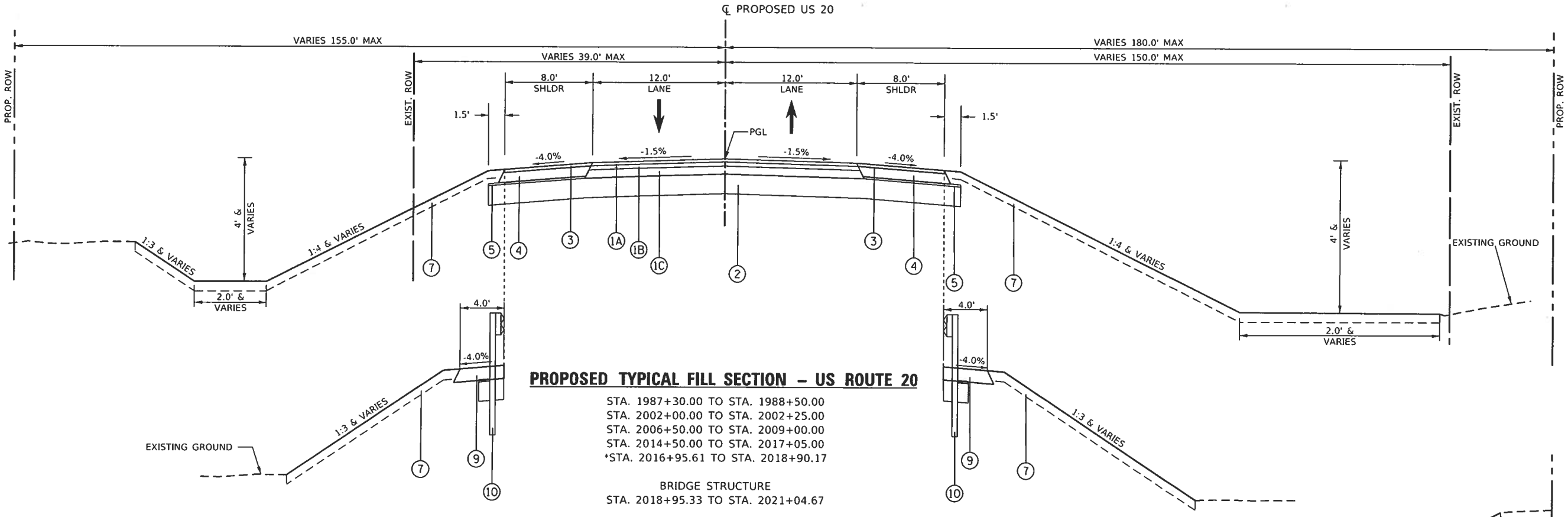
USER NAME = EtzwilleE	DESIGNED - ALM	REVISED -	
	DRAWN - ALM	REVISED -	
PLOT SCALE = 100.0000 ' / in.	CHECKED - CPK	REVISED -	
PLOT DATE = 2/18/2019	DATE - 2/18/2019	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

TYPICAL SECTIONS
US 20

SCALE: N.T.S. | SHEET 2 OF 14 SHEETS | STA. | TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
301	24R	JODAVIESS	493	21
		CONTRACT NO. 64B40		
		ILLINOIS	FED. AID PROJECT	



PROPOSED TYPICAL FILL SECTION – US ROUTE 20

STA. 1987+30.00 TO STA. 1988+50.00
STA. 2002+00.00 TO STA. 2002+25.00
STA. 2006+50.00 TO STA. 2009+00.00
STA. 2014+50.00 TO STA. 2017+05.00
*STA. 2016+95.61 TO STA. 2018+90.17

BRIDGE STRUCTURE
STA. 2018+95.33 TO STA. 2021+04.67

*STA. 2021+09.83 TO STA. 2022+91.89

* INDICATES FILL SECTION WITH GUARDRAIL

PROPOSED TYPICAL ROCK CUT SECTION – US ROUTE 20

STA. 1996+50.00 TO STA. 1999+75.00
STA. 2009+00.00 TO STA. 2014+50.00
STA. 2028+00.00 TO STA. 2034+00.00
STA. 2153+00.00 TO STA. 2155+50.00

NOTE: THE UNIT WEIGHT USED TO CALCULATE ALL HOT-MIX ASPHALT SURFACE MIXTURES IS 112 LBS/SQ.YD./IN
TYPICAL ROCK CUT SECTIONS VARIES BASED ON HEIGHT OF CUT. SEE ROCK CUT DETAILS FOR MORE INFORMATION

PROPOSED LEGEND

1. HOT-MIX ASPHALT PAVEMENT (FULL-DEPTH), 9 1/2"
   - 1A 2" POLYMERIZED HOT-MIX ASPHALT SURFACE COURSE, MIX "D", N70
   - 1B 2 1/2" POLYMERIZED HOT-MIX ASPHALT BINDER COURSE, IL-19.0, N70
   - 1C 5" LEVELING BINDER (MACHINE METHOD), N70
2. AGGREGATE SUBGRADE IMPROVEMENT, 12" (REFER TO TABLE PROVIDED FOR VARYING THICKNESSES AND LOCATIONS)
3. 2" POLYMERIZED HOT-MIX ASPHALT SURFACE COURSE, MIX "D", N70
4. HOT-MIX ASPHALT SHOULDER, 6"
5. CA6 OR CA10 (COST INCLUDED IN HOT-MIX ASPHALT SHOULDERS, 6")
6. 3" INCIDENTAL HOT-MIX ASPHALT SURFACING
7. TOPSOIL FURNISH AND PLACE, 6"
8. COMBINATION CONCRETE CURB & GUTTER, TYPE B-6.24
9. AGGREGATE SHOULDERS, TYPE B 6"
10. STEEL PLATE BEAM GUARDRAIL, TYPE A, 9 FOOT POSTS

MODEL: Default
FILE NAME: pw:\\rshaw01.rsandh.com:PW_RSHDocuments\Transportation\Projects\13005S.000 US 20 Stockton\CADD\CAD Sheets\026B40-sht-typ03.dgn

RS&H

USER NAME = EtzwilleE	DESIGNED - ALM	REVISED -	
	DRAWN - ALM	REVISED -	
PLOT SCALE = 100.0000 ' / in.	CHECKED - CPK	REVISED -	
PLOT DATE = 2/18/2019	DATE - 2/18/2019	REVISED -	

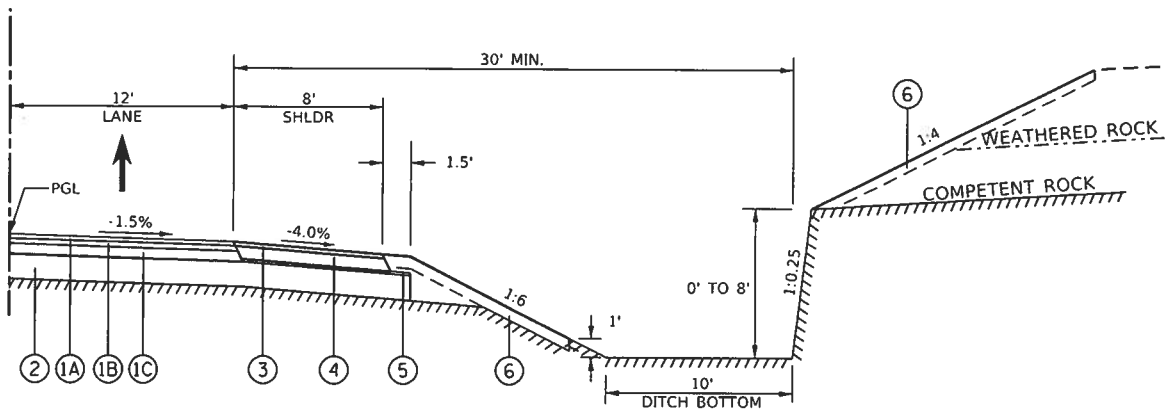
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

TYPICAL SECTIONS
US 20

SCALE: N.T.S. | SHEET 3 OF 14 SHEETS | STA. | TO STA.

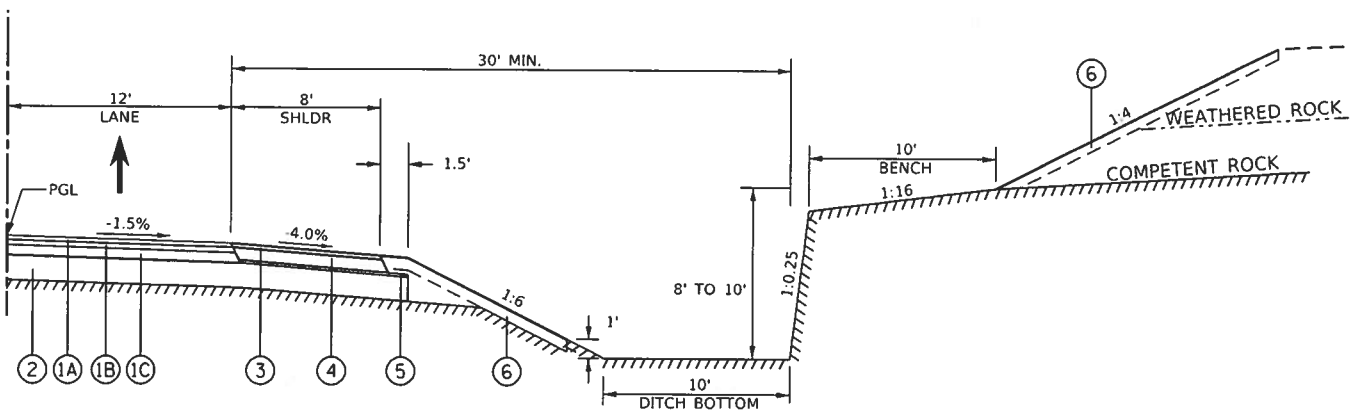
F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
301	24R	JODAVIESS	493	22
		CONTRACT NO. 64B40		
	ILLINOIS	FED. AID PROJECT		

℄ PROPOSED US 20



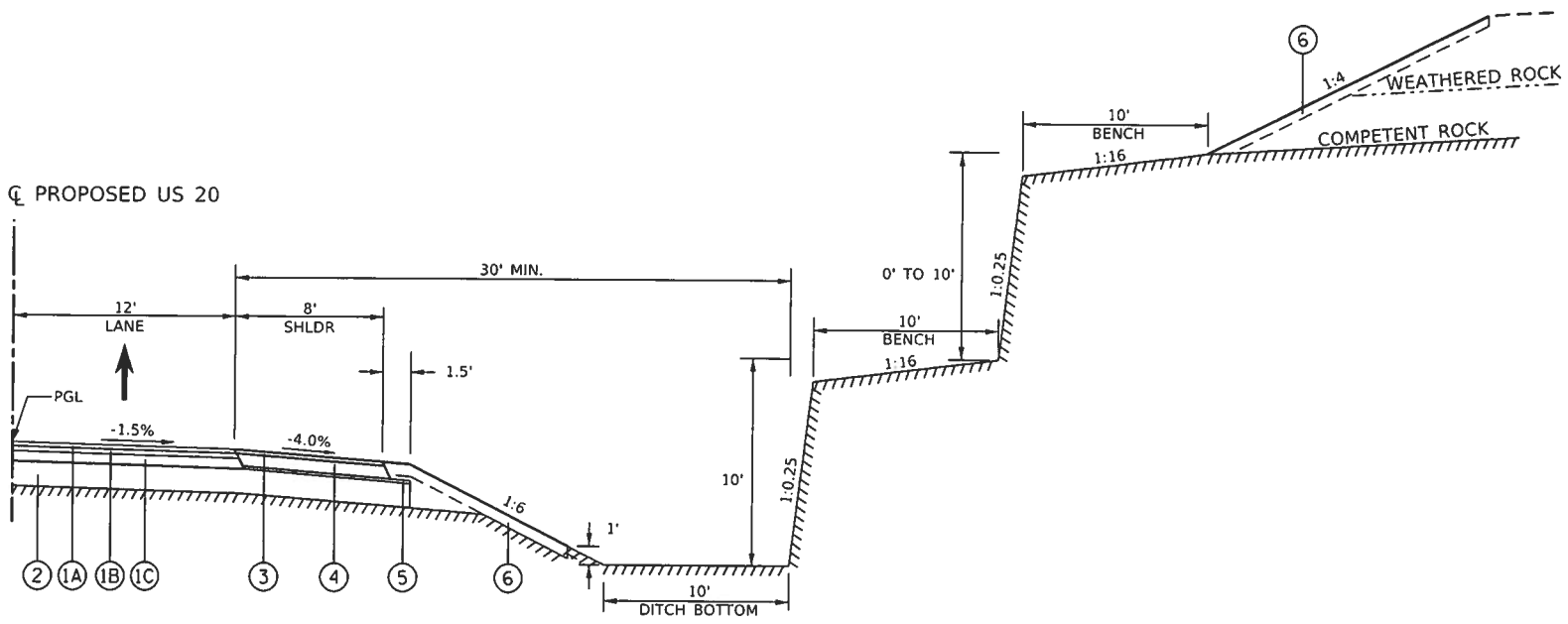
FOR HEIGHTS < 8 FT

℄ PROPOSED US 20



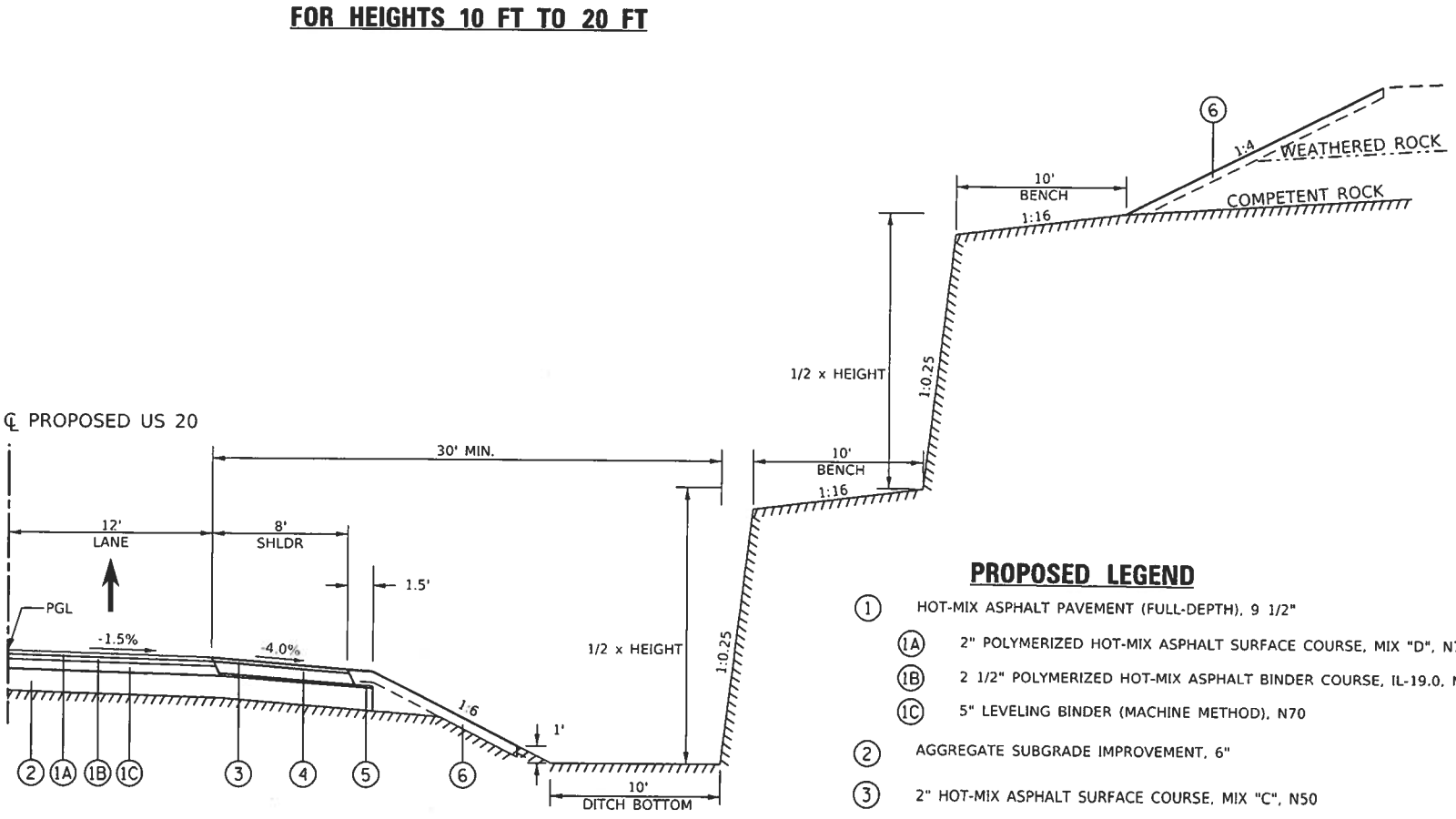
FOR HEIGHTS 8 FT TO 10 FT

℄ PROPOSED US 20



FOR HEIGHTS 10 FT TO 20 FT

℄ PROPOSED US 20



FOR HEIGHTS > 20 FT

PROPOSED LEGEND

1. HOT-MIX ASPHALT PAVEMENT (FULL-DEPTH), 9 1/2"
   - 1A 2" POLYMERIZED HOT-MIX ASPHALT SURFACE COURSE, MIX "D", N70
   - 1B 2 1/2" POLYMERIZED HOT-MIX ASPHALT BINDER COURSE, IL-19.0, N70
   - 1C 5" LEVELING BINDER (MACHINE METHOD), N70
2. AGGREGATE SUBGRADE IMPROVEMENT, 6"
3. 2" HOT-MIX ASPHALT SURFACE COURSE, MIX "C", N50
4. HOT-MIX ASPHALT SHOULDER, 6"
5. CA6 OR CA10 (COST INCLUDED IN HOT-MIX ASPHALT SHOULDERS, 6")
6. TOPSOIL FURNISH AND PLACE, 6"

RS&H

USER NAME = EtzwilleE
PLOT SCALE = 100.0000 ' / in.
PLOT DATE = 2/18/2019

DESIGNED - ALM
DRAWN - ALM
CHECKED - CPK
DATE - 2/18/2019

REVISED -
REVISED -
REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

TYPICAL SECTIONS
US 20 ROCK CUT

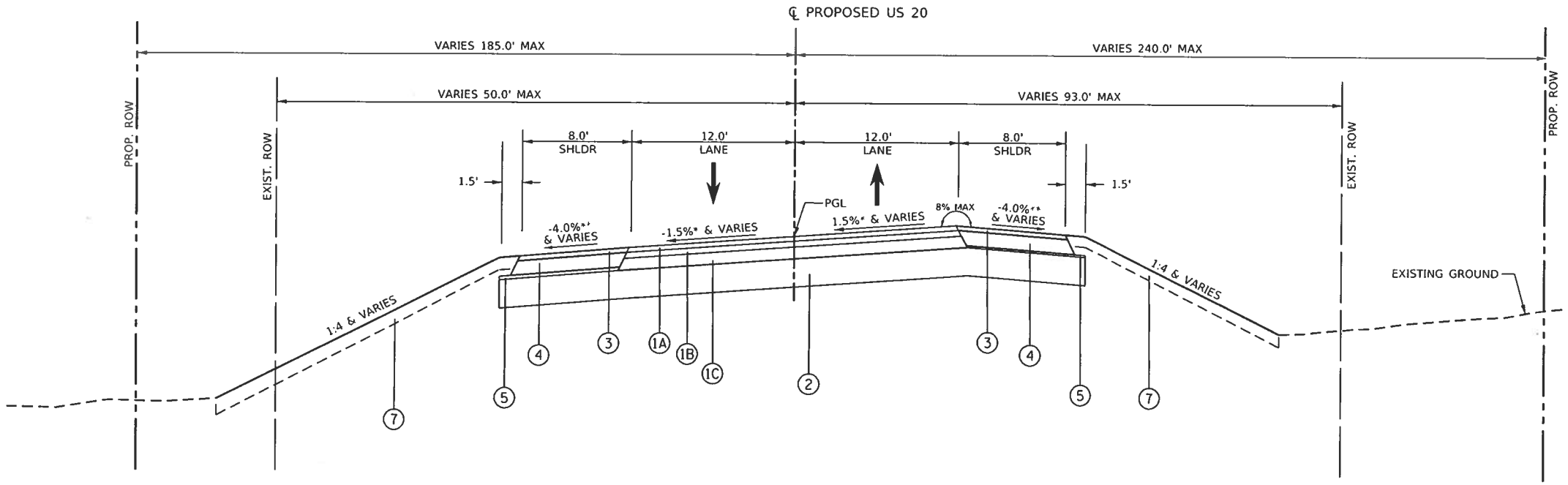
SHEET 7 OF 14 SHEETS STA. TO STA.

SCALE: N.T.S.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
301	24R	JODAVIESS	493	23

ILLINOIS FED. AID PROJECT

CONTRACT NO. 64B40



PROPOSED SUPERELEVATED TYPICAL SECTION – US ROUTE 20

STA. 2138+00.00 TO STA. 2164+19.96
STA. 2165+89.62 TO STA. 2168+00.00

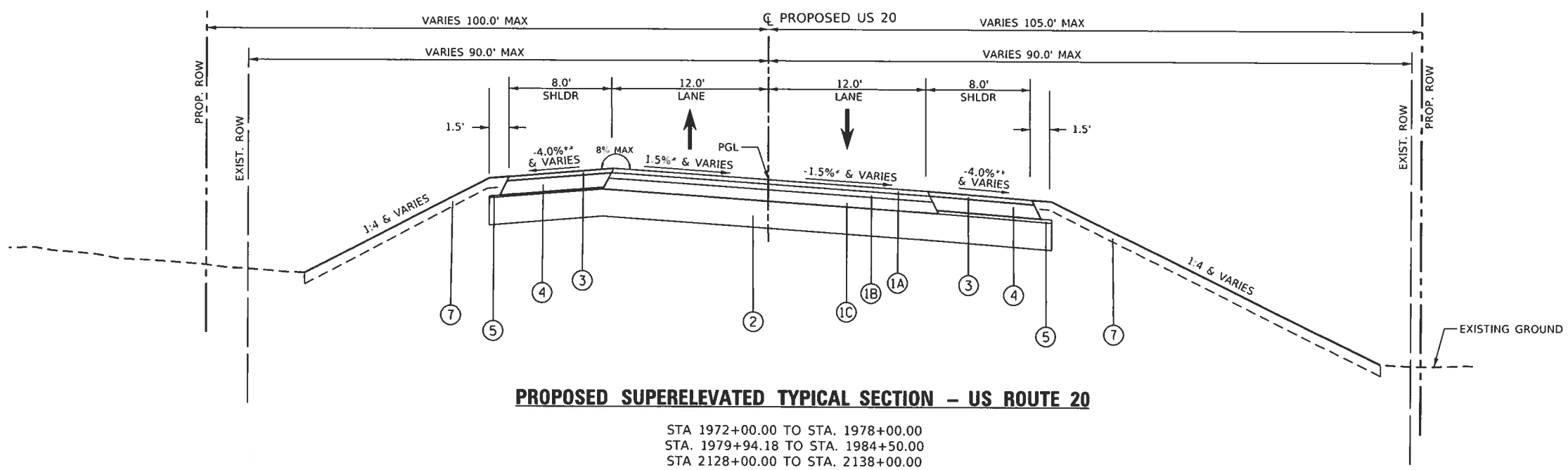
PROPOSED LEGEND

1. HOT-MIX ASPHALT PAVEMENT (FULL-DEPTH), 9 1/2"
   - 1A. 2" POLYMERIZED HOT-MIX ASPHALT SURFACE COURSE, MIX "D", N70
   - 1B. 2 1/2" POLYMERIZED HOT-MIX ASPHALT BINDER COURSE, IL-19.0, N70
   - 1C. 5" LEVELING BINDER (MACHINE METHOD), N70
2. AGGREGATE SUBGRADE IMPROVEMENT, 12" (REFER TO TABLE PROVIDED FOR VARYING THICKNESSES AND LOCATIONS)
3. 2" POLYMERIZED HOT-MIX ASPHALT SURFACE COURSE, MIX "D", N70
4. HOT-MIX ASPHALT SHOULDER, 6"
5. CA6 OR CA10 (COST INCLUDED IN HOT-MIX ASPHALT SHOULDERS, 6")
6. 3" INCIDENTAL HOT-MIX ASPHALT SURFACING
7. TOPSOIL FURNISH AND PLACE, 6"
8. COMBINATION CONCRETE CURB & GUTTER, TYPE B-6.24
9. AGGREGATE SHOULDERS, TYPE B 6"
10. STEEL PLATE BEAM GUARDRAIL, TYPE A, 9 FOOT POSTS

* SEE US 20 SUPERELEVATION TABLE FOR LANE CROSS SLOPE.
** SHOULDER CROSS SLOPE WILL VARY WITH THE LANE CROSS SLOPE. THE BREAK BETWEEN THE LANE AND THE SHOULDER CROSS SLOPE SHALL BE NO MORE THAN 8%. THE SHOULDER CROSS SLOPE SHALL MATCH THE LANE CROSS SLOPE ON THE LOW SIDE OF THE PAVEMENT WHEN THE LANE CROSS SLOPE EXCEEDS 4%.

US 20 SUPERELEVATION TABLE

LT		RT	
1968+93.07	-1.50%	1971+12.94	-1.50%
1974+42.94	6.00%	1974+42.94	-6.00%
1981+62.37	6.00%	1981+62.37	-6.00%
1987+12.24	-1.50%	1984+92.37	-1.50%
2127+34.55	-1.50%	2128+14.51	-1.50%
2129+16.51	5.30%	2129+16.51	-5.30%
2135+59.01	5.30%	2135+59.01	-5.30%
2137+40.97	-1.50%	2136+61.01	-1.50%
2138+26.41	-1.50%	2137+46.45	-1.50%
2138+77.41	-3.40%	2138+77.41	3.40%
2166+82.10	-3.40%	2166+82.10	3.40%
2167+77.10	-1.50%	2169+27.01	-1.50%
2173+21.47	-1.50%	2174+71.38	-1.50%
2176+51.38	5.10%	2176+51.38	-5.10%
2181+36.73	5.10%	2181+36.73	-5.10%
2184+66.64	-1.50%	2183+16.73	-1.50%



PROPOSED SUPERELEVATED TYPICAL SECTION – US ROUTE 20

STA 1972+00.00 TO STA. 1978+00.00
STA. 1979+94.18 TO STA. 1984+50.00
STA 2128+00.00 TO STA. 2138+00.00
STA 2175+50.00 TO STA. 2183+00.00

NOTE: THE UNIT WEIGHT USED TO CALCULATE ALL HOT-MIX ASPHALT SURFACE MIXTURES IS 112 LBS/SQ.YD./IN

MODEL: Default
FILE NAME: pw:\\rshaw01.rsandh.com:PW_RSHDoc.unnent\Transportation\Projects\1130059.000 US 20 Stockton\CADD\CAD Sheets\D2E1040-sht-cyp04.dgn

RS&H

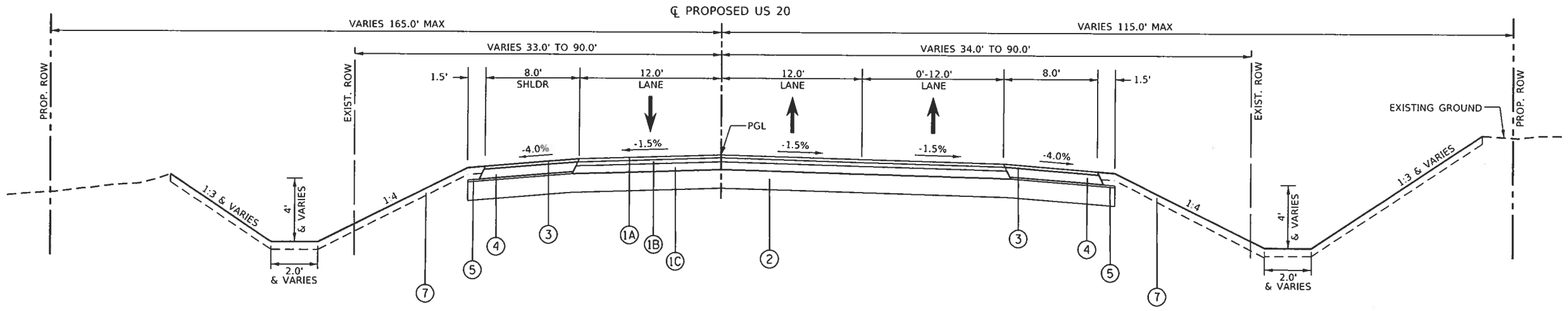
USER NAME = EtzwilleE	DESIGNED - ALM	REVISED -	
	DRAWN - ALM	REVISED -	
PLOT SCALE = 100.0000 ' / in	CHECKED - CPK	REVISED -	
PLOT DATE = 2/18/2019	DATE - 2/18/2019	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

TYPICAL SECTIONS
US 20

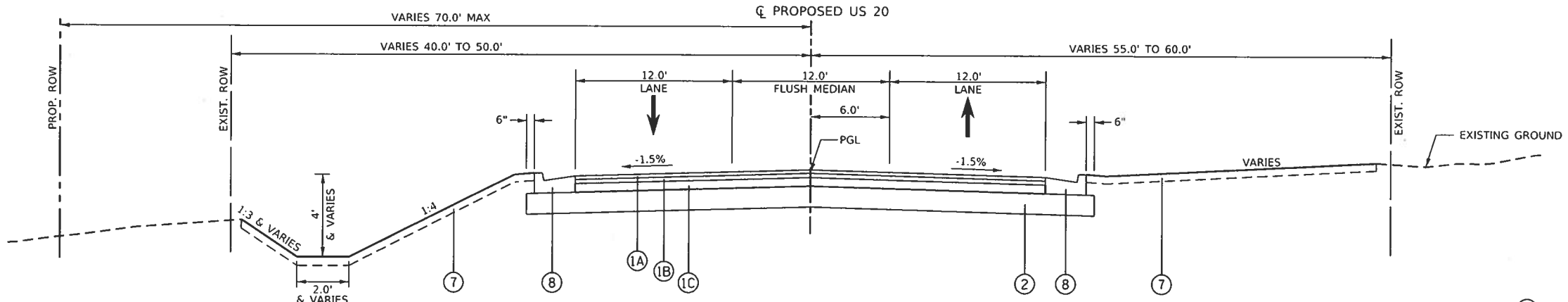
SCALE: N.T.S. | SHEET 4 OF 14 SHEETS | STA. | TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
301	24R	JODAVIESS	493	24
		CONTRACT NO. 64B40		
	ILLINOIS	FED. AID PROJECT		



PROPOSED TYPICAL SECTION – US ROUTE 20 TRUCK CLIMBING LANE

STA. 2021+30.00 TO STA. 2062+00.00



PROPOSED TYPICAL SECTION – US ROUTE 20

STA. 2181+38.15 TO STA. 2183+58.00

PROPOSED LEGEND

1. HOT-MIX ASPHALT PAVEMENT (FULL-DEPTH), 9 1/2"
   - 1A. 2" POLYMERIZED HOT-MIX ASPHALT SURFACE COURSE, MIX "D", N70
   - 1B. 2 1/2" POLYMERIZED HOT-MIX ASPHALT BINDER COURSE, IL-19.0, N70
   - 1C. 5" LEVELING BINDER (MACHINE METHOD), N70
2. AGGREGATE SUBGRADE IMPROVEMENT, 12" (REFER TO TABLE PROVIDED FOR VARYING THICKNESSES AND LOCATIONS)
3. 2" POLYMERIZED HOT-MIX ASPHALT SURFACE COURSE, MIX "D", N70
4. HOT-MIX ASPHALT SHOULDER, 6"
5. CA6 OR CA10 (COST INCLUDED IN HOT-MIX ASPHALT SHOULDERS, 6")
6. 3" INCIDENTAL HOT-MIX ASPHALT SURFACING
7. TOPSOIL FURNISH AND PLACE, 6"
8. COMBINATION CONCRETE CURB & GUTTER, TYPE B-6.24
9. AGGREGATE SHOULDERS, TYPE B 6"
10. STEEL PLATE BEAM GUARDRAIL, TYPE A, 9 FOOT POSTS

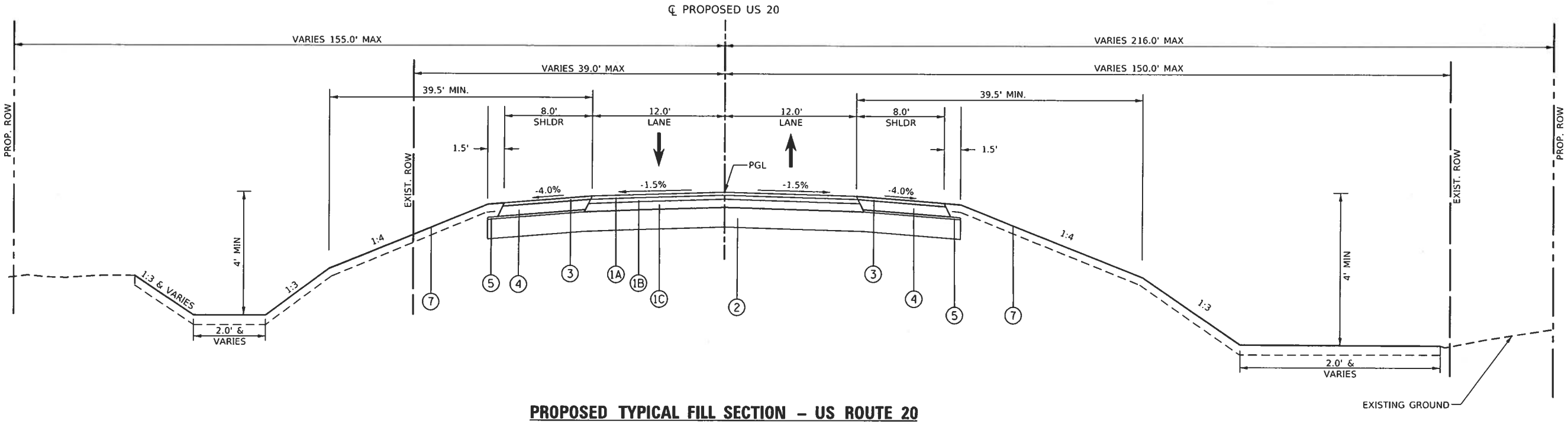
NOTE: THE UNIT WEIGHT USED TO CALCULATE ALL HOT-MIX ASPHALT SURFACE MIXTURES IS 112 LBS/SQ.YD./IN

MODEL: Default
FILE NAME: pw:\\rshow01.rsandh.com:PW_RSInDocuments\Transportation\Projects\13D059.000 US 20 Stockton\CADCAD_Sheets\D264840-plt-vp05.dgn

RS&H

USER NAME = EtzwilleE		DESIGNED - ALM	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	TYPICAL SECTIONS US 20
		DRAWN - ALM	REVISED -		
PLOT SCALE = 100.0000 ' / in.		CHECKED - CPK	REVISED -		SCALE: N.T.S. SHEET 5 OF 14 SHEETS STA. TO STA.
PLOT DATE = 2/18/2019		DATE - 2/18/2019	REVISED -		

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
301	24R	JODAVIESS	493	25
		CONTRACT NO. 64B40		
	ILLINOIS	FED. AID PROJECT		



PROPOSED TYPICAL FILL SECTION – US ROUTE 20

STA. 2001+50.00 TO 2005+80.00
STA. 2023+27.00 TO 2025+85.00

PROPOSED LEGEND

(1) HOT-MIX ASPHALT PAVEMENT (FULL-DEPTH), 9 1/2"
- (1A) 2" POLYMERIZED HOT-MIX ASPHALT SURFACE COURSE, MIX "D", N70
- (1B) 2 1/2" POLYMERIZED HOT-MIX ASPHALT BINDER COURSE, IL-19.0, N70
- (1C) 5" LEVELING BINDER (MACHINE METHOD), N70

(2) AGGREGATE SUBGRADE IMPROVEMENT, 12"
(REFER TO TABLE PROVIDED FOR VARYING THICKNESSES AND LOCATIONS)

(3) 2" POLYMERIZED HOT-MIX ASPHALT SURFACE COURSE, MIX "D", N70

(4) HOT-MIX ASPHALT SHOULDER, 6"

(5) CA6 OR CA10 (COST INCLUDED IN HOT-MIX ASPHALT SHOULDERS, 6")

(6) 3" INCIDENTAL HOT-MIX ASPHALT SURFACING

(7) TOPSOIL FURNISH AND PLACE, 6"

(8) COMBINATION CONCRETE CURB & GUTTER, TYPE B-6.24

(9) AGGREGATE SHOULDERS, TYPE B 6"

(10) STEEL PLATE BEAM GUARDRAIL, TYPE A, 9 FOOT POSTS

NOTE: THE UNIT WEIGHT USED TO CALCULATE ALL HOT-MIX ASPHALT SURFACE MIXTURES IS 112 LBS/SQ.YD./IN

MODEL: Default
FILE NAME: c:\w3shared01.rsandh.com\PW_RSHIDocuments\Transportation\Projects\11390059.000 US 20 Stockton\CAD\CAD Sheets\D26480340-sht-xp06.dgn

RS&H

USER NAME = EtzwilleE	DESIGNED - ALM	REVISED -	
	DRAWN - ALM	REVISED -	
PLOT SCALE = 100.0000 ' / in.	CHECKED - CPK	REVISED -	
PLOT DATE = 2/18/2019	DATE - 2/18/2019	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

TYPICAL SECTIONS
US 20

SCALE: N.T.S. | SHEET 6 OF 14 SHEETS | STA. | TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
301	24R	JODAVIESS	493	26
		CONTRACT NO. 64B40		
	ILLINOIS	FED. AID PROJECT		

BDE 5401 Template (Rev. 11/22/2019)

IDOT MECHANISTIC PAVEMENT DESIGN

Printed: 11/26/2019

PROJECT AND TRAFFIC INPUTS

(Enter Data in Gray Shaded Cells)

Route: FAP 301 (US 20)
Section: 24R
County: JODAVIESS
Location: LOGEMANN RD TO STOCKTON
Facility Type: Other Marked State Route

Comments: CONTRACT 64B40
Design Date: 11/26/2019
Modify Date:

<-- BY
<-- BY

	ADT	Year
Current:	-	-
Future:	-	-

# of Lanes = 2 or 3
Part of future 4 lanes or more ? No
One Way Street ? No
Road Class: II

Subgrade Support Rating (SSR): Poor
Construction Year: 2025
Design Period (DP) = 20 years

	Structural Design Traffic			
	Minimum ADT	Actual ADT	Actual %of Total ADT	% of ADT in Design Lane
PV =	0	5,775	86.8%	P = 50%
SU =	250	180	2.7%	S = 50%
MU =	750	695	10.5%	M = 50%
Struct. Design ADT =		6,650	(2035)	

TRAFFIC FACTOR CALCULATION

FLEXIBLE PAVEMENT			RIGID PAVEMENT		
Cpv =	0.15		Cpv =	0.15	
Csu =	112.06		Csu =	135.78	
Cmu =	385.44		Cmu =	567.21	
TF flexible (Actual) =	2.89	(Actual ADT)	TF rigid (Actual) =	4.20	(Actual ADT)
TF flexible (Min) =	3.17	(Min ADT Fig. 54-2.C)	TF rigid (Min) =	4.59	(Min ADT Fig. 54-2.C)

NEW CONSTRUCTION / RECONSTRUCTION PAVEMENT DESIGN CALCULATIONS

Full-Depth HMA Pavement

Use TF flexible = 3.17
PG Grade Lower Binder Lifts = PG 64-22 (Fig. 53-4.O)
Goto Map
HMA Mixture Temp. = 73.0 deg. F (Fig. 54-5.C)
Design HMA Mixture Modulus (E_{HMA}) = 760 ksi (Fig. 54-5.D)
Design HMA Strain (ε_{HMA}) = 86 (Fig. 54-5.E)
Goto Map
Full Depth HMA Design Thickness = 9.50 in. (Fig. 54-5.F)
Limiting Strain Criterion Thickness = 14.25 in. (Fig. 54-5.I)

Use Full-Depth HMA Thickness = 9.50 inches

JPC Pavement

Use TF rigid = 4.59
Edge Support = Tied Shoulder or C&G

Rigid Pavt Thick. = 9.00 in. (Fig. 54-4.E)

CRC Pavement

Use TF rigid = 4.59
IBR value = 3

CRCP Thickness = 7.75 in. (Fig. 54-4.N)

TF MUST BE > 60 FOR CRCP

RECONSTRUCTION ONLY (SUPPLEMENTAL) PAVEMENT DESIGN CALCULATIONS

HMA Pavement Over Rubblized PCC

Use TF flexible = 3.17
HMA Overlay Design Thickness = 7.00 in. (Fig. 54-5.U)
Goto Map
Limiting Strain Criterion Thickness = 10.75 in. (Fig. 54-5.V)

Use HMA Overlay Thickness = 7.00 inches

Unbonded Concrete Overlay

Review 54-4.03 for limitations and special considerations.

JPCP Thickness = NA inches

CONTACT RESEARCH FOR ASSISTANCE

DESIGN TABLES FROM BDE MANUAL CHAPTER 54 - PAVEMENT DESIGN

Class I Roads	Class II Roads	Class III Roads	Class IV Roads
4 lanes or more Part of a future 4 lanes or more One-way Streets with ADT > 3500	2 lanes with ADT > 2000 One way Street with ADT <= 3500	2 Lanes (ADT 750 -2000)	2 Lanes (ADT < 750)

	Min. Str. Design Traffic (Fig 54-2.C)		
Facility Type	PV	SU	MU
Interstate or Freeway	0	500	1500
Other Marked State Route	0	250	750
Unmarked State Route	No Min	No Min	No Min

Class Table for One-Way Streets	
ADT	Class
0 - 3500	II
>3501	I

	Traffic Factor ESAL Coefficients			
	Rigid (Fig. 54-4.C)		Flexible (Fig. 54-5.B)	
Class	Csu	Cmu	Csu	Cmu
I	143.81	696.42	132.50	482.53
II	135.78	567.21	112.06	385.44
III	129.58	562.47	109.14	384.35
IV	129.58	562.47	109.14	384.35

Class Table for 2 or 3 lanes (not future 4 lane & not one-way street)	
ADT	Class
0 - 749	IV
750 - 2000	III
>2000	II

	Design Lane Distribution Factors For Structural Design Traffic (Fig. 54-2.B)					
	Rural			Urban		
Number of Lanes	P	S	M	P	S	M
1 Lane Ramp	100%	100%	100%	100%	100%	100%
2 or 3	50%	50%	50%	50%	50%	50%
4	32%	45%	45%	32%	45%	45%
6 or more	20%	40%	40%	8%	37%	37%

BDE 5401 Template (Rev. 11/22/2019) Printed: 11/26/2019

LIFE-CYCLE COST ANALYSIS: NEW CONSTRUCTION / RECONSTRUCTION

FULL-DEPTH HMA PAVEMENT

Standard Design

ROUTE	FAP 301 (US 20)
SECTION	24R
COUNTY	JODAVIESS
LOCATION	LOGEMANN RD TO STOCKTON
FACILITY TYPE	NON-INTERSTATE

PROJECT LENGTH			21468	FT = = >	4.07 Miles
# OF CENTERLINES			1	CL	
# OF LANES			2	LANES	
# OF EDGES			2	EP	
LANE WIDTH - AVERAGE			12	FT	
SHOULDER WIDTH	HMA	Left	8	FT	
	HMA	Right	8	FT	
	Total Width of Paved Shoulders		16	FT	

PAVEMENT THICKNESS (FLEXIBLE)	9.50	IN	14.25 IN MAX
SHOULDER THICKNESS	8.00	IN	HMA SD Standard Design
HMA OVERLAY THICKNESS	2.00	IN	

FLEX PAVEMENT TRAFFIC FACTORS	MINIMUM	ACTUAL	USE
	3.17	2.89	3.17

Read Me!

HMA COST PER TON	UNIT PRICE
HMA SURFACE	$0.00 / TON
HMA TOP BINDER	$0.00 / TON
HMA LOWER BINDER	$0.00 / TON
HMA BINDER (IL-9.5FG or IL-4.75)	$0.00 / TON
HMA SHOULDER	$0.00 / TON

INITIAL COSTS

ITEM	THICKNESS		100% QUANTITY	UNIT		UNIT PRICE		COST	
HMA PAVEMENT (FULL-DEPTH)	(9.50")	57248	57,248	SQ YD	*	$47.86	/ SQ YD	$2,739,889	~
HMA SURFACE COURSE	(2.00")	1.0069	6,456	TONS	*	$97.08	/ TON	$0	
HMA TOP BINDER COURSE	(2.25")	1.0217	7,370	TONS	*	$84.88	/ TON	$0	
HMA LOWER BINDER COURSE	(5.25")	1.0477	17,634	TONS	*	$84.21	/ TON	$0	
HMA SHOULDER	(8.00")	38165	38,165	SQ YD	*	$34.50	/ SQ YD	$1,316,704	~
CURB & GUTTER			0	LIN FT		$0.00	/ LIN FT	$0	
SUBBASE GRAN MATL TY C (TONS)			0	TONS		$28.00	/ TON	$0	
IMPROVED SUBGRADE:	Aggregate	Width = 42.6	101,575	SQ YD		$11.49	/ SQ YD	$1,167,097	
Reserved For User Supplied Item			0	UNITS		$0.00	/ UNITS	$0	
Reserved For User Supplied Item			0	UNITS		$0.00	/ UNITS	$0	
PAVEMENT REMOVAL			57,248	SQ YD		$10.00	/ SQ YD	$572,480	
SHOULDER REMOVAL			38,165	SQ YD		$5.00	/ SQ YD	$190,825	

Note: * Denotes User Supplied Quantity

FLEXIBLE CONSTRUCTION INITIAL COST	$5,986,995
FLEXIBLE CONSTRUCTION ANNUAL COST PER MILE	$60,056

MAINTENANCE COSTS:

ITEM		THICKNESS		MATERIAL	T	UNIT COST	
ROUTINE MAINTENANCE ACTIVITY						$0.00	LANE-MILE / YEAR
HMA OVERLAY PVMT SURF		(2.00")	1.0069	Surface Mix	2.00	$10.60	/ SQ YD
HMA OVERLAY PVMT		(2.00")	1.0069		2.00	$11.56	/ SQ YD
HMA SURFACE MIX		(2.00")	1.0069	Surface Mix	2.00	$7.96	/ SQ YD
HMA BINDER MIX		(0.00")	1.0139	4.75 Binder Mix	0.00	$3.60	/ SQ YD
HMA OVERLAY SHLD	(Year 30)	(2.00")		Shoulder Mix	2.00	$10.44	/ SQ YD
HMA OVERLAY SHLD		(2.00")		Shoulder Mix	2.00	$9.48	/ SQ YD
MILLING (2.00 IN)					2.00	$1.80	/ SQ YD
PARTIAL DEPTH PVMT PATCH		(Mill & Fill Surf)		Surface Mix	2.00	$43.98	/ SQ YD
PARTIAL DEPTH SHLD PATCH		(Mill & Fill Surf)		Shoulder Mix	2.00	$0.00	/ SQ YD
PARTIAL DEPTH PVMT PATCH		(Mill & Fill +2.00 ")		Binder Mix	2.00	$30.58	/ SQ YD
PARTIAL DEPTH SHLD PATCH		(Mill & Fill +2.00 ")		Shoulder Mix	2.00	$40.96	/ SQ YD
LONGITUDINAL SHOULDER JOINT ROUT & SEAL						$0.90	/ LIN FT
CENTERLINE JOINT ROUT & SEAL						$0.90	/ LIN FT
RANDOM / THERMAL CRACK ROUT & SEAL			(100% Rehab = 110.00' / Station / Lane)			$0.90	/ LIN FT

FLEXIBLE TOTAL LIFE-CYCLE COST	$7,543,691
FLEXIBLE TOTAL ANNUAL COST PER MILE	$75,671

FULL-DEPTH HMA PAVEMENT
HMA PAVEMENT OVER RUBBLIZED PCC PAVEMENT
Figure 54-7.C
STANDARD DESIGN

MAINTENANCE COSTS:	ITEM	%	QUANTITY	UNIT	UNIT COST		COST	PRESENT WORTH
YEAR 5								
	LONG SHLD JT R&S	100.00%	42,936	LIN FT	$0.90		$38,642	
	CNTR LINE JOINT R&S	100.00%	21,468	LIN FT	$0.90		$19,321	
	RNDM / THRM CRACK R&S	50.00%	23,615	LIN FT	$0.90		$21,254	
	PD PVMT PATCH M&F SURF	0.10%	57	SQ YD	$43.98		$2,507	
	PWFn =	0.8626		PW =	0.8626	X	$81,724	$70,496
YEAR 10								
	LONG SHLD JT R&S	100.00%	42,936	LIN FT	$0.90		$38,642	
	CNTR LINE JOINT R&S	100.00%	21,468	LIN FT	$0.90		$19,321	
	RNDM / THRM CRACK R&S	50.00%	23,615	LIN FT	$0.90		$21,254	
	PD PVMT PATCH M&F SURF	0.50%	286	SQ YD	$43.98		$12,578	
	PWFn =	0.7441		PW =	0.7441	X	$91,795	$68,304
YEAR 15								
	MILL PVMT & SHLD 2.00"	100.00%	95,413	SQ YD	$1.80		$171,743	
	PD PVMT PATCH M&F ADD'L 2.00"	1.00%	572	SQ YD	$30.58		$17,492	
	HMA OVERLAY PVMT 2.00"	100.00%	57,248	SQ YD	$10.60		$606,829	
	HMA OVERLAY SHLD 2.00 "	100.00%	38,165	SQ YD	$9.48		$361,807	
	PWFn =	0.6419		PW =	0.6419	X	$1,157,871	$743,193
YEAR 20								
	LONG SHLD JT R&S	100.00%	42,936	LIN FT	$0.90		$38,642	
	CNTR LINE JOINT R&S	100.00%	21,468	LIN FT	$0.90		$19,321	
	RNDM / THRM CRACK R&S	50.00%	23,615	LIN FT	$0.90		$21,254	
	PD PVMT PATCH M&F SURF	0.10%	57	SQ YD	$43.98		$2,507	
	PWFn =	0.5537		PW =	0.5537	X	$81,724	$45,249
YEAR 25								
	LONG SHLD JT R&S	100.00%	42,936	LIN FT	$0.90		$38,642	
	CNTR LINE JOINT R&S	100.00%	21,468	LIN FT	$0.90		$19,321	
	RNDM / THRM CRACK R&S	50.00%	23,615	LIN FT	$0.90		$21,254	
	PD PVMT PATCH M&F SURF	0.50%	286	SQ YD	$43.98		$12,578	
	PWFn =	0.4776		PW =	0.4776	X	$91,795	$43,842
	HMA_SD							
YEAR 30	NON-INTERSTATE							
	MILL PVMT & SHLD 2.00"	100.00%	95,413	SQ YD	$1.80		$171,743	
	PD PVMT PATCH M&F ADD'L 2.00"	2.00%	1,145	SQ YD	$30.58		$35,014	
	PD SHLD PATCH M&F ADD'L 2.00"	1.00%	382	SQ YD	$40.96		$15,647	
	HMA OVERLAY PVMT 2.00 "	100.00%	57,248	SQ YD	$11.56		$661,787	
	HMA OVERLAY SHLD 2.00 "	100.00%	38,165	SQ YD	$10.44		$398,446	
	PWFn =	0.4120		PW =	0.4120	X	$1,282,637	$528,429
YEAR 35								
	LONG SHLD JT R&S	100.00%	42,936	LIN FT	$0.90		$38,642	
	CNTR LINE JOINT R&S	100.00%	21,468	LIN FT	$0.90		$19,321	
	RNDM / THRM CRACK R&S	50.00%	23,615	LIN FT	$0.90		$21,254	
	PD PVMT PATCH M&F SURF	0.10%	57	SQ YD	$43.98		$2,507	
	PWFn =	0.3554		PW =	0.3554	X	$81,724	$29,043
YEAR 40								
	LONG SHLD JT R&S	100.00%	42,936	LIN FT	$0.90		$38,642	
	CNTR LINE JOINT R&S	100.00%	21,468	LIN FT	$0.90		$19,321	
	RNDM / THRM CRACK R&S	50.00%	23,615	LIN FT	$0.90		$21,254	
	PD PVMT PATCH M&F SURF	0.50%	286	SQ YD	$43.98		$12,578	
	PWFn =	0.3066		PW =	0.3066	X	$91,795	$28,140
								$1,556,696
	ROUTINE MAINTENANCE ACTIVITY		8.13	Lane Miles	0.00		$0	$0
					MAINTENANCE LIFE-CYCLE COST			$1,556,696
45	YEAR LIFE CYCLE	CRFn = 0.0407852			MAINTENANCE ANNUAL COST PER MILE			$15,615

PCC PAVEMENT

JPCP

ROUTE			FAP 301 (US 20)		
SECTION			24R		
COUNTY			JODAVIESS		
LOCATION			LOGEMANN RD TO STOCKTON		
FACILITY TYPE			NON-INTERSTATE		
PROJECT LENGTH			21468 FT	= = >	4.07 Miles
# OF CENTERLINES			1 CL		
# OF LANES			2 LANES		
# OF EDGES			2 EP		
LANE WIDTH - AVERAGE			12 FT		
SHOULDER WIDTH	PCC	Left	8 FT		
	PCC	Right	8 FT		
	Total Width of Paved Shoulders		16 FT		
PAVEMENT THICKNESS (RIGID)		JPCP	9.00 IN		TIED SHLD
SHOULDER THICKNESS			9.00 IN		
HMA OVERLAY THICKNESS			2.75 IN		

RIGID PAVEMENT TRAFFIC FACTORS		MINIMUM	ACTUAL	USE
		4.59	4.20	4.59
Worksheet Construction Type is	New Construction		The Pavement Type is	JPCP

INITIAL COSTS

ITEM	THICKNESS	100% QUANTITY	UNIT	UNIT PRICE		COST
JPC PAVEMENT	(9.00")	57,248	SQ YD	$47.92	/ SQ YD	$2,743,324
PAVEMENT REINFORCEMENT		0	SQ YD	$0.00	/ SQ YD	$0
STABILIZED SUBBASE	(4.00")	64,404	SQ YD	$15.82	/ SQ YD	$1,018,871
PCC SHOULDERS		38,165	SQ YD	$39.88	/ SQ YD	$1,522,020
CURB & GUTTER		0	LIN FT	$0.00	/ LIN FT	$0
SUBBASE GRAN MATL TY C	(~ 1.80")	4,656	TONS	$22.11	/ TON	$102,944
IMPROVED SUBGRADE:	Modified Soil Width = 41.0'	97,799	SQ YD	$11.47	/ SQ YD	$1,121,755
Reserved For User Supplied Item		0	UNITS	$0.00	/ UNITS	$0
Reserved For User Supplied Item		0	UNITS	$0.00	/ UNITS	$0
PAVEMENT REMOVAL		57,248	SQ YD	$10.00	/ SQ YD	$572,480
SHOULDER REMOVAL		38,165	SQ YD	$5.00	/ SQ YD	$190,825

Note: * Denotes User Supplied Quantity

RIGID CONSTRUCTION INITIAL COST	$7,272,219
RIGID CONSTRUCTION ANNUAL COST PER MILE	$72,948

MAINTENANCE COSTS:

ITEM	THICKNESS		MATERIAL	T	UNIT COST	
ROUTINE MAINTENANCE ACTIVITY					$0.00	/ LANE-MILE / YEAR
HMA OVERLAY	(2.75")			2.75		
HMA OVERLAY PAVEMENT	(2.75")	1.0095		2.75	$12.86	/ SQ YD
HMA SURFACE MIX	(1.50")	1.0092	Surface Mix	1.50	$7.97	/ SQ YD
HMA BINDER MIX	(1.25")	1.0148	4.75 Binder Mix	1.25	$4.89	/ SQ YD
HMA OVERLAY SHOULDER	(2.75")		Shoulder Mix	2.75	$11.86	/ SQ YD
CLASS A PAVEMENT PATCHING					$0.00	/ SQ YD
CLASS B PAVEMENT PATCHING					$180.00	/ SQ YD
CLASS C SHOULDER PATCHING					$140.00	/ SQ YD
PARTIAL DEPTH PVMT PATCH (Mill & Fill HMA Surf)			Surface Mix	1.50	$0.00	/ SQ YD
PARTIAL DEPTH PVMT PATCH (Mill & Fill HMA 2.75")			Surface Mix	2.75	$50.48	/ SQ YD
LONGITUDINAL SHOULDER JOINT ROUT & SEAL					$0.90	/ LIN FT
CENTERLINE JOINT ROUT & SEAL					$0.90	/ LIN FT
REFLECTIVE TRANSVERSE CRACK ROUT & SEAL					$0.90	/ LIN FT
RANDOM CRACK ROUT & SEAL	(100% Rehab = 100.00' / Station / Lane)				$0.90	/ LIN FT

RIGID TOTAL LIFE-CYCLE COST	$8,402,255
RIGID TOTAL ANNUAL COST PER MILE	$84,283

JOINTED PLAIN CONCRETE PAVEMENT
UNBONDED JOINTED PLAIN CONCRETE OVERLAY
Figure 54-7.A

MAINTENANCE COSTS:	ITEM	%	QUANTITY	UNIT	UNIT COST		COST	PRESENT WORTH
YEAR 10								
	PAVEMENT PATCH CLASS B	0.10%	57	SQ YD	$180.00		$10,260	
	PWFn =	0.7441		PW =	0.7441	X	$10,260	$7,634
YEAR 15								
	PAVEMENT PATCH CLASS B	0.20%	114	SQ YD	$180.00		$20,520	
	PWFn =	0.6419		PW =	0.6419	X	$20,520	$13,171
YEAR 20								
	PAVEMENT PATCH CLASS B	2.00%	1,145	SQ YD	$180.00		$206,100	
	SHOULDER PATCH CLASS C	0.50%	191	SQ YD	$140.00		$26,740	
	LONGITUDINAL SHLD JT R&S	100.00%	42,936	LIN FT	$0.90		$38,642	
	CENTERLINE JT R&S	100.00%	21,468	LIN FT	$0.90		$19,321	
	PWFn =	0.5537		PW =	0.5537	X	$290,803	$161,011
YEAR 25								
	PAVEMENT PATCH CLASS B	3.00%	1,717	SQ YD	$180.00		$309,060	
	SHOULDER PATCH CLASS C	1.00%	382	SQ YD	$140.00		$53,480	
	PWFn =	0.4776		PW =	0.4776	X	$362,540	$173,151
YEAR 30	NON-INTERSTATE							
	PAVEMENT PATCH CLASS B	4.00%	2,290	SQ YD	$180.00		$412,200	
	SHOULDER PATCH CLASS C	1.50%	572	SQ YD	$140.00		$80,080	
	HMA OVERLAY 2.75" (PVMT)	100.00%	57,248	SQ YD	$12.86		$736,209	
	HMA OVERLAY 2.75" (SHLD)	100.00%	38,165	SQ YD	$11.86		$452,641	
	PWFn =	0.4120		PW =	0.4120	X	$1,681,130	$692,603
YEAR 35	NON-INTERSTATE							
	LONGITUDINAL SHLD JT R&S	100.00%	42,936	LIN FT	$0.90		$38,642	
	CENTERLINE JT R&S	100.00%	21,468	LIN FT	$0.90		$19,321	
	RANDOM CRACK R&S	50.00%	21,468	LIN FT	$0.90		$19,321	
	REFLECTIVE TRANSVERSE CRACK R&S	40.00%	13,738	LIN FT	$0.90		$12,364	
	PD PVMT PATCH M&F HMA 2.75"	0.10%	57	SQ YD	$50.48		$2,877	
	PWFn =	0.3554		PW =	0.3554	X	$92,525	$32,882
YEAR 40	NON-INTERSTATE							
	PAVEMENT PATCH CLASS B	0.50%	286	SQ YD	$180.00		$51,480	
	LONGITUDINAL SHLD JT R&S	100.00%	42,936	LIN FT	$0.90		$38,642	
	CENTERLINE JT R&S	100.00%	21,468	LIN FT	$0.90		$19,321	
	REFLECTIVE TRANSVERSE CRACK R&S	60.00%	20,606	LIN FT	$0.90		$18,545	
	RANDOM CRACK R&S	50.00%	21,468	LIN FT	$0.90		$19,321	
	PD PVMT PATCH M&F HMA 2.75"	0.50%	286	SQ YD	$50.48		$14,437	
	PWFn =	0.3066		PW =	0.3066	X	$161,746	$49,584
								$1,130,036
	ROUTINE MAINTENANCE ACTIVITY		8.13	Lane Miles	$0.00		$0	$0
					MAINTENANCE LIFE-CYCLE COST			$1,130,036
45	YEAR LIFE CYCLE	CRFn = 0.0407852			MAINTENANCE ANNUAL COST PER MILE			$11,335

LIFE-CYCLE COST ANALYSIS: NEW DESIGN

Calculated / Revised : **11/26/19 8:17 AM**

			JPCP	HMA
CONSTRUCTION	INITIAL COST	PRESENT WORTH	$7,272,219	$5,986,995
		ANNUAL COST PER MILE	$72,948	$60,056
MAINTENANCE	LIFE-CYCLE COST	PRESENT WORTH	$1,130,036	$1,556,696
		ANNUAL COST PER MILE	$11,335	$15,615
TOTAL	LIFE-CYCLE COST	PRESENT WORTH	$8,402,255	$7,543,691
		ANNUAL COST PER MILE	$84,283	$75,671

LIFE-CYCLE COST ANALYSIS: FINAL SUMMARY

LOWEST COST OPTION	==========>	**HMA**	**$75,671**	
OTHER OPTIONS (LOWEST TO HIGHEST):	TYPE / PERCENTAGE	**JPCP**	**$84,283**	**11.4%**